Claims

[c1] 1.A lighting system for night vision applications comprising:

a near infrared light source;

a visible, non-red light source;

a beamsplitter arranged to reflect light emitting from one of said near infrared light source or visible light source and transmit light emitting from the other of said near infrared light source or visible light source so as to produce a color-corrected light source; and

an optical element disposed a distance from said color-corrected light source, the optical element having an input surface for receiving light from said color-corrected light source and an output surface for emitting said received light in a desired emission pattern.

[c2] 2.A lighting system according to claim 1 wherein said near infrared light source comprises a laser diode transmitting light wavelengths between approximately 800nm-900nm and said visible light source comprises a light source emitting light having wavelengths between approximately 400-600 nm.

[c3] 3.A lighting system according to claim 1 wherein said beamsplitter comprises a dichroic beamsplitter adapted to reflect near infrared light wavelengths and transmit visible light wavelengths.

[c4] 4.A lighting system according to claim 1 wherein said beamsplitter comprises a holographic notch filter adapted to reflect near infrared light wavelengths.

[c5] 5.A lighting system according to claim 1 comprising a camera adapted to receive near infrared light from said near infrared light source reflected off an object within a camera field of view.

[c6] 6.A lighting system according to claim 1 comprising a second optical element disposed between said color-corrected light source and said optical element, said second optical element transmitting said color-corrected light in a divergent emission pattern toward said optical element input surface.

[c7] 7.A lighting system according to claim 6 wherein said second optical element comprises a diffuser.

[c8] 8.A lighting system according to claim 1 wherein said optical element output surface is approximately perpendicular to said input surface, and said optical element comprises a stepped surface angled between the input surface and the output surface, the stepped surface having a plurality of reflecting facets arranged such that the light is reflected by the plurality of reflecting facets in passing from the input surface to the output surface.

[c9] 9.A lighting system according to claim 1 wherein said optical element comprises a thin-sheet optical element comprising an aspherical entrance surface for collimating light passing through the entrance surface, a substantially planar exit surface generally perpendicular to an axis of symmetry of the entrance surface, and a stepped surface opposing the substantially planar exit surface having a plurality of steps generally parallel to the exit surface separated by associated angled facets disposed at an angle to reflect the light passing through the entrance surface and out the exit surface.

[c10] 10.A lighting system for night vision applications comprising:
a near infrared light source;
a non-red visible light source;
a first optical element disposed a distance from said near infrared light source, the first optical element having an input surface for receiving light from said near infrared light source and an output surface for emitting said received light in a desired emission pattern; and
a second optical element disposed a distance from said visible light source, the second optical element having an input surface for receiving light from said visible light source and an output surface for emitting said received light in a desired emission pattern,
wherein the first and second optical elements are arranged such that the emission patterns of each optical element are substantially identical and overlapping to form a single color-corrected light emission pattern.

[c11] 11.A lighting system according to claim 10 wherein said first and second optical elements comprise substantially planar, thin-sheet optical elements and said first and second optical elements are substantially identical and arranged in

parallel.

[c12] 12.A lighting system according to claim 10 wherein said near infrared light source comprises a laser diode transmitting light wavelengths between approximately 800nm-900nm and said visible light source comprises an incandescent or LED light source emitting light in a visible spectrum.

[c13] 13.A lighting system according to claim 10 wherein the output surface of each of said first and second optical elements is approximately perpendicular to the input surface, and each optical element comprises a stepped surface angled between the input surface and the output surface, the stepped surface having a plurality of reflecting facets arranged such that the light is reflected by the plurality of reflecting facets in passing from the input surface to the output surface.

[c14] 14.A lighting system according to claim 10 wherein each of said first and second optical elements comprises a thin-sheet optical element comprising an aspherical entrance surface for collimating light passing through the entrance surface, a substantially planar exit surface generally perpendicular to an axis of symmetry of the entrance surface, and a stepped surface opposing the substantially planar exit surface having a plurality of steps generally parallel to the exit surface separated by associated angled facets disposed at an angle to reflect the light passing through the entrance surface and out the exit surface.

[c15] 15.A lighting system according to claim 10 comprising a camera adapted to receive near infrared light from said near infrared light source reflected off an object within a camera field of view.

[c16] 16.A lighting system according to claim 15 comprising a display adapted to receive data from said camera and display said detected objects.

[c17] 17.A night vision system comprising:
a near infrared light source;
a non-red visible light source;
a beamsplitter arranged to reflect light emitting from one of said near infrared light source or visible light source and transmit light emitting from the other of

said near infrared light source or visible light source so as to produce a color-corrected light source;

a thin-sheet optical element disposed a distance from said color-corrected light source, the optical element having an input surface for receiving light from said color-corrected light source, an output surface approximately perpendicular to the input surface for emitting said received light, and a stepped surface angled between the input surface and the output surface, the stepped surface having a plurality of reflecting facets arranged such that the light is reflected by the plurality of reflecting facets in passing from the input surface to the output surface; and

a camera adapted to receive near infrared light from said near infrared light source reflected off an object within a camera field of view; and

a display adapted to receive data from said camera and display said detected objects.

[c18] 18.A night vision system according to claim 17 wherein said near infrared light source comprises a laser diode transmitting light wavelengths between approximately 800nm-900nm.

[c19] 19.A night vision system according to claim 18 wherein said visible light source comprises an incandescent light source or white-light emitting LED.

[c20] 20.A night vision system according to claim 18 wherein said visible light source comprises a green or amber light emitting diode.